

Surface Mount Ultrafast Rectifier


SMA (DO-214AC)

FEATURES

- Low profile package
- Ideal for automated placement
- Oxide planar chip junction
- Ultrafast recovery times for high frequency
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- AEC-Q101 qualified available
 - Automotive ordering code: base P/NHE3 or P/NHM3
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912


RoHS
 COMPLIANT
HALOGEN
FREE
 Available

TYPICAL APPLICATIONS

For use in secondary rectification and freewheeling for ultrafast switching speeds AC/AC and DC/DC converters in high temperature conditions for both consumer and automotive applications.

MECHANICAL DATA

Case: SMA (DO-214AC)

Molding compound meets UL 94 V-0 flammability rating

Base P/N-E3 - RoHS-compliant, commercial grade

Base P/N-M3 - halogen-free, RoHS-compliant, commercial grade

Base P/NHE3_X - RoHS-compliant and AEC-Q101 qualified

Base P/NHM3_X - halogen-free, RoHS-compliant, and AEC-Q101 qualified

("_X" denotes revision code e.g. A, B,))

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD 22-B102

E3, M3, HE3, and HM3 suffix meets JESD 201 class 2 whisker test

Polarity: Color band denotes cathode end

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.0 A
V_{RRM}	100 V, 150 V, 200 V
I_{FSM}	30 A
t_{rr}	25 ns
V_F at $I_F = 1.0$ A	0.76 V
T_J max.	175 °C
Package	SMA (DO-214AC)
Diode variations	Single

MAXIMUM RATINGS ($T_A = 25$ °C unless otherwise noted)					
PARAMETER	SYMBOL	UH1B	UH1C	UH1D	UNIT
Device marking code		HB	HC	HD	
Maximum repetitive peak reverse voltage	V_{RRM}	100	150	200	V
Maximum average forward rectified current (fig. 1)	$I_{F(AV)}$	1.0			A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	30			A
Operating junction and storage temperature range	T_J, T_{STG}	-55 to +175			°C



ELECTRICAL CHARACTERISTICS ($T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted)						
PARAMETER	TEST CONDITIONS	SYMBOL	TYP.	MAX.	UNIT	
Instantaneous forward voltage	$I_F = 0.6\text{ A}$	$T_A = 25\text{ }^\circ\text{C}$	$V_F^{(1)}$	0.90	-	V
	$I_F = 1.0\text{ A}$			0.96	1.05	
	$I_F = 0.6\text{ A}$	$T_A = 125\text{ }^\circ\text{C}$		0.70	-	
	$I_F = 1.0\text{ A}$			0.76	0.90	
Reverse current	Rated V_R	$T_A = 25\text{ }^\circ\text{C}$	$I_R^{(2)}$	-	1.0	μA
		$T_A = 125\text{ }^\circ\text{C}$		7.5	25	
Maximum reverse recovery time	$I_F = 0.5\text{ A}$, $I_R = 1.0\text{ A}$, $I_{rr} = 0.25\text{ A}$	$T_A = 25\text{ }^\circ\text{C}$	t_{rr}	13	25	ns
Typical reverse recovery time	$I_F = 1.0\text{ A}$, $dI/dt = 50\text{ A}/\mu\text{s}$, $V_R = 30\text{ V}$, $I_{rr} = 0.1 I_{RM}$			21	30	
Typical softness factor (t_b/t_a)	$I_F = 1.0\text{ A}$, $dI/dt = 200\text{ A}/\mu\text{s}$, $V_R = 200\text{ V}$	$T_A = 125\text{ }^\circ\text{C}$	S	0.8	-	-
Typical reverse recovery current			I_{RM}	2.7	4.0	A
Typical stored charge			Q_{rr}	35	-	nC
Typical junction capacitance			C_J	17	-	pF

Notes

- (1) Pulse test: 300 μs pulse width, 1 % duty cycle
(2) Pulse test: Pulse width $\leq 40\text{ ms}$

THERMAL CHARACTERISTICS ($T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted)					
PARAMETER	SYMBOL	UH1B	UH1C	UH1D	UNIT
Typical thermal resistance	$R_{\theta JA}^{(1)}$	120			$^\circ\text{C}/\text{W}$
	$R_{\theta JM}^{(1)}$	20			

Note

- (1) Free air, mounted on recommended copper pad area. Thermal resistance $R_{\theta JA}$ - junction to ambient, $R_{\theta JM}$ - junction to mount

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
UH1D-E3/61T	0.064	61T	1800	7" diameter plastic tape and reel
UH1D-E3/5AT	0.064	5AT	7500	13" diameter plastic tape and reel
UH1DHE3_A/H ⁽¹⁾	0.064	H	1800	7" diameter plastic tape and reel
UH1DHE3_A/I ⁽¹⁾	0.064	I	7500	13" diameter plastic tape and reel
UH1D-M3/61T	0.064	61T	1800	7" diameter plastic tape and reel
UH1D-M3/5AT	0.064	5AT	7500	13" diameter plastic tape and reel
UH1DHM3_A/H ⁽¹⁾	0.064	H	1800	7" diameter plastic tape and reel
UH1DHM3_A/I ⁽¹⁾	0.064	I	7500	13" diameter plastic tape and reel

Note

- (1) AEC-Q101 qualified



RATINGS AND CHARACTERISTICS CURVES (T_A = 25 °C unless otherwise noted)

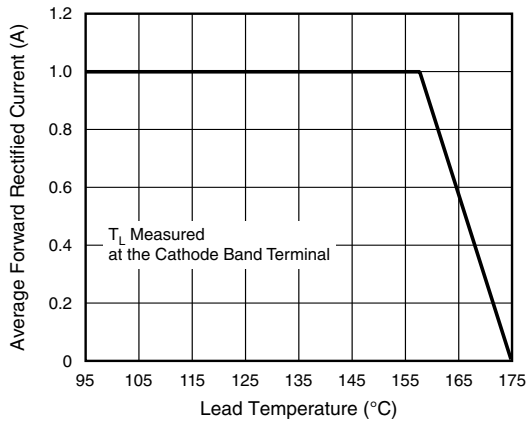


Fig. 1 - Maximum Forward Current Derating Curve

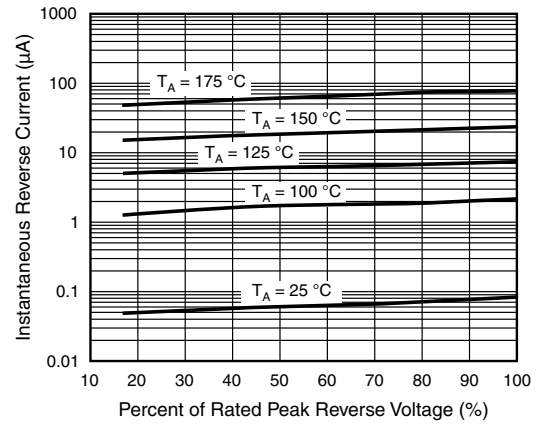


Fig. 4 - Typical Reverse Characteristics

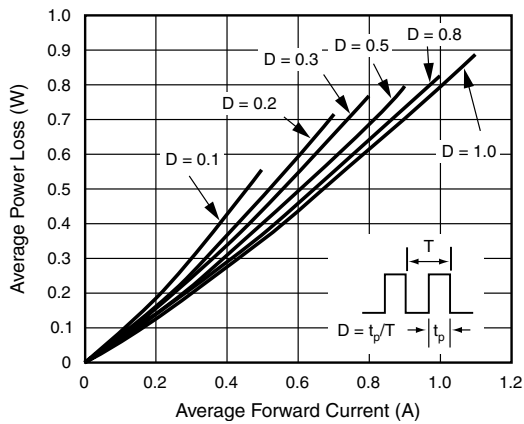


Fig. 2 - Forward Power Loss Characteristics

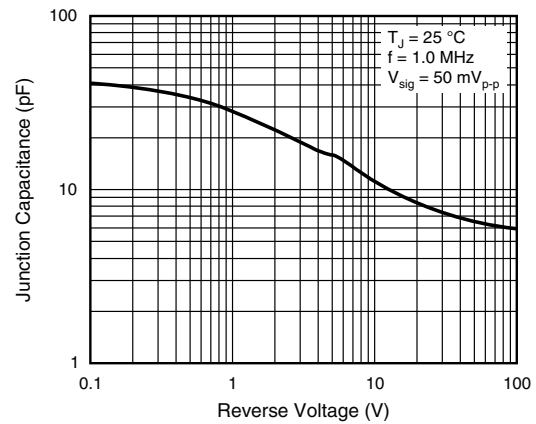


Fig. 5 - Typical Junction Capacitance

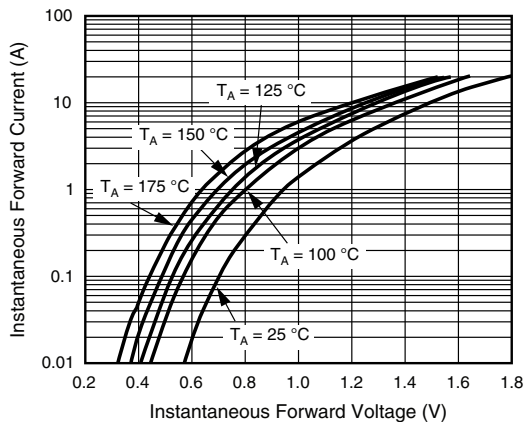


Fig. 3 - Typical Instantaneous Forward Characteristics

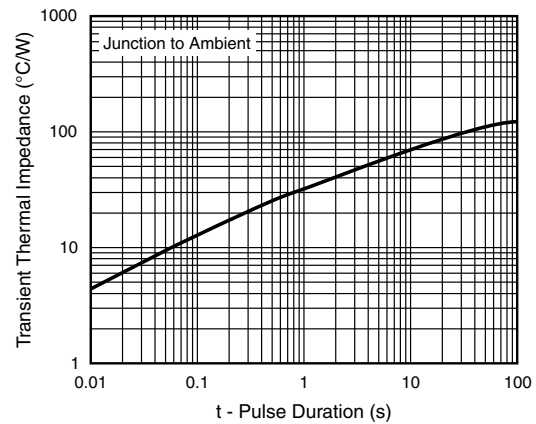
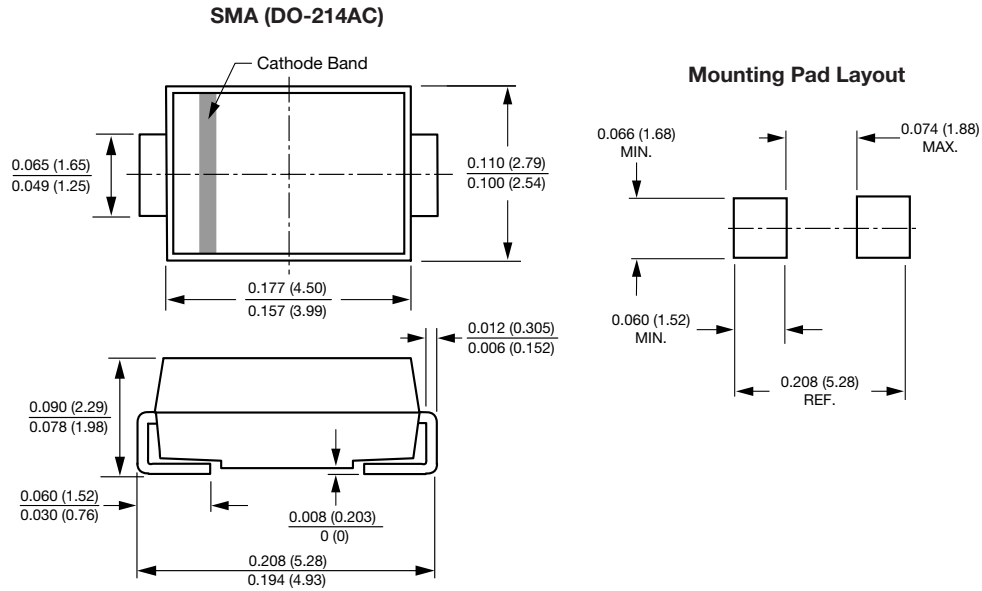


Fig. 6 - Typical Transient Thermal Impedance



PACKAGE OUTLINE DIMENSIONS in inches (millimeters)





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